Haltungen und Bedürfnisse der Schweizer Bevölkerung zu E-Voting = Attitudes of Swiss citizens towards the generalisation of e-voting

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ATTITUDES OF SWISS CITIZENS

TOWARDS THE GENERALISATION OF E-VOTING

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Contents

1 Introduction

«In the long run», so the then Swiss Chancellor Corina Casanova in an opinion piece in the NZZ[1]said, «everybody eligible shall be able to vote electronically. » This however is not the case yet. According to the Swiss Chancellor, this is because the following two questions, for the time being, cannot be answered with a clear no: «Is there the possibility that the results from elections and referenda can be manipulated? Is there the possibility that the secrecy of the ballot could be breached? » Indeed, it is of huge importance for the credibility of the Swiss democracy, both elections and referenda, that the citizens be confident in the decision making processes. But how do the people think about this issue? Do they have severe doubts on security or are they more afraid of the risk of manipulation of the results of elections and referenda? How does the electorate generally feel about the introduction of E-Voting[2]? How big is the demand for this way of casting one's ballot and to which demographics do the advocates and opponents of E-Voting belong? This article will try to answer these and other questions.

For this purpose, we will take a closer look at the usage of E-Voting. Following the demand, this includes the expectations of the citizens regarding E-Voting. The third part will examine the attitudes of the electorate in regard of often cited arguments for and against E-Voting. In the subsequent chapter the article will be dedicated to the trust of the electorate in the electronic casting of their ballots. A further, more expansive chapter, will undertake a detailed analysis of attitudes concerning the introduction of E-Voting: Which factors enhance the likelihood to support E-Voting and which one diminish it? This analysis is based on the data gathered by a survey, undertaken by the LINK Institute for the ZDA, from the 11th to the 21th of April 2016.

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[1] http://www.nzz.ch/meinung/kommentare/sicherheit-schafft-vertrauen-ld.2271

[2] It would be more precise to speak of Internet-Voting. The term E-voting can also entail, for example touchscreen voting devices, which are used in voting booths. However, since in Switzerland the term E-Voting refers to the concept analysed in this article, we will use it as a synonym for Internet-Voting.

2   The Usage of E-Voting

Electronic voting is for the moment the nearly exclusive right of Swiss citizens living abroad (compare: Germann/Serdült 2014; Germann et al. 2014), which are registered in a Canton that provides them this possibility. In the last National elections in 2015 there were four cantons (GE, LU, BS, NE) which offered this possibility to their 34'000 registered citizens abroad. Furthermore, in the cantons of Geneva and Neuchatel 96'000 *domestic* citizens were able to cast their ballot electronically. All in all, however the people with access to the E-Voting techniques remain a minute part of the overall electorate (compare: Bundeskanzlei 2013; Serdült et al. 2015).

Similarly, only six percent (n=73)[3] of the people interviewed for the survey stated to have be able to cast their ballot electronically in past elections or referenda. Not surprisingly these were mostly citizens from the three cantons Geneva, Neuchatel and Vaud.[4] This was however also due to the fact that Swiss citizens who lived abroad were not included in the population used for sampling (for further information consider the chapter on the data).

Among the 73 respondents who had the possibility, of voting electronically, only slightly less than half (41%) stated to have made use thereof. This value is similar to the number of citizens that regularly[5] cast their ballots in a referendum. (Approximately every three months there is a voting day where the electorate can cast their ballot on a number of different referenda). Among those surveyed, 39 percent stated that they always cast their ballot, including those who often vote the number rises to 50 percent. However, the number must be taken with caution due to the low number of cases. For this reason we choose not offer a further socio-demographic analysis of the usage of the E-Voting.

TABLE 1: USAGE OF E-VOTING (PROPORTIONS IN %)

TYPES OF USAGE	N	YES	NO
POSSIBILITY OF USING E-VOTING	1228	6	91
EFFECTIVE USAGE OF E-VOTING	73	41	59

The combination of «Yes» and «No» doesn't always add up to 100 as don't know was also a possible response.

Furthermore, it was inquired how probable it was that one would vote *more often,* if one had had the possibility of voting electronically. The question is of hypothetical nature; hence the answers must also be interpreted with caution. In total, 17 percent stated they would definitely vote more often, if there was the possibility to vote electronically. A further 22 percent stated that in such a case they would probably vote more often. 60 percent however denied such a possibility – some

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[3] The proportions for the whole of Switzerland are always weighted. For further information compare the methodological chapter in the appendix. The absolute number of cases is however not weighted.
[4] The question posed was for the *actual* residency. It is hence possible, that a person which is currently resident in a canton which does not offer E-Voting *previously* had their residency in a canton which did offer E-Voting.
[5] The precise wording of the Question, which was used, the measure of the frequency of voting, was in its original German: «*An Abstimmungen nimmt häufig weniger als die Hälfte von allen Stimmberechtigten teil. Wie ist das bei Ihnen? Angenommen, in einem Jahr gibt es 10 Abstimmungen. An wie vielen davon nehmen Sie normalerweise teil?*» This translates to: Usually less than half the electorate participates in referenda. How is it with you? Let's say there were 10 referenda in a given year. In how many would you participate? »

were more and some less certain. The statements regarding the vote participation must always be taken with caution due to social desirability; this is exemplified by the fact that, from those who stated that they would definitely participated more often, around a third – according to their own statements – already participated in every referendum. The actual «participation gain» through electronic voting in Switzerland should be much less than the stated 17 percent, as many previous studies have shown or at least suspected (Bochsler; Sciarini et al. 2013; Serdült/Trechsel 2006: 15-16). Albeit it was mostly the momentarily underrepresented young voters who answered the question on higher participation with «definitely yes» or «possibly yes».

3   Demand for online services by government agencies and expectations of E-Voting

Services provided by government agencies (in a democratic community) are also conceived to fit the demand of the citizens. How big is the general demand from the public for E-Voting and where is there more or less demand? Table 2 contains the information regarding the demand for three online services provided by government agencies. The other two online services are the possibility, to compile the tax return form online and the possibility of ordering a new ID card online. These two additional online services provide us with a better understanding of the demand for E-Voting. The interviewed could rate the necessity on a scale from 0 (superfluous) to 10 (absolutely necessary), where 5 was the middle category.

TABLE 2: DEMAND FOR SERVICES BY GOVERNMENT AGENCIES (MEAN AND AMOUNT FOR ABSOLUTELY NECESSARY AND SUPERFLUOUS)

| OFFER	N	MEAN	ABSOLUTELY NECESSARY	SUPERFLUOUS
THE POSSIBILITY, TO COMPILE THE TAX RETURNS FORM ONLINE.	1228	7.7	48	8
THE POSSIBILITY, TO CAST ONE'S BALLOT ONLINE.	1228	6.3	25	13
THE POSSIBILITY, OF ORDERING A NEW ID CARD ONLINE.	1228	6.4	30	14

The E-Voting offer has a mean of 6.3 on the 11-point scale. Hence, overall, the positive evaluations outweigh negative ones. This means that there are more mentions which consider E-Voting necessary rather than unnecessary. About a quarter of the respondents, stated that they considered it *absolutely* necessary (maximum value of 10), while 13 percent considered it completely superfluous (minimal value of 0). The last group is mostly composed of those interviewed who, in general, never or rarely use the internet and furthermore are rather disinterested in politics.[6] About a third of those found none of the online offers necessary. About four percent of the electorate are therefore not opposed to E-Voting in particular, but to online services in general. In the explanation of high demand multiple factors play a role: First and foremost, the age of the respondents. The younger a subject was, the more likely he/she was to regard E-Voting as necessary. This can very well be considered a harbinger of a future increase in demand: In the near future the groups, who already consider E-Voting a necessity, will come to form a dominating majority. In other words: the demand for E-Voting will increase over time.

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[6] Amongst those who never use the internet, the proportion of those who deem online voting superfluous was 46 percent. In comparison only seven percent of those, who use the internet on a daily basis, where of the same opinion.
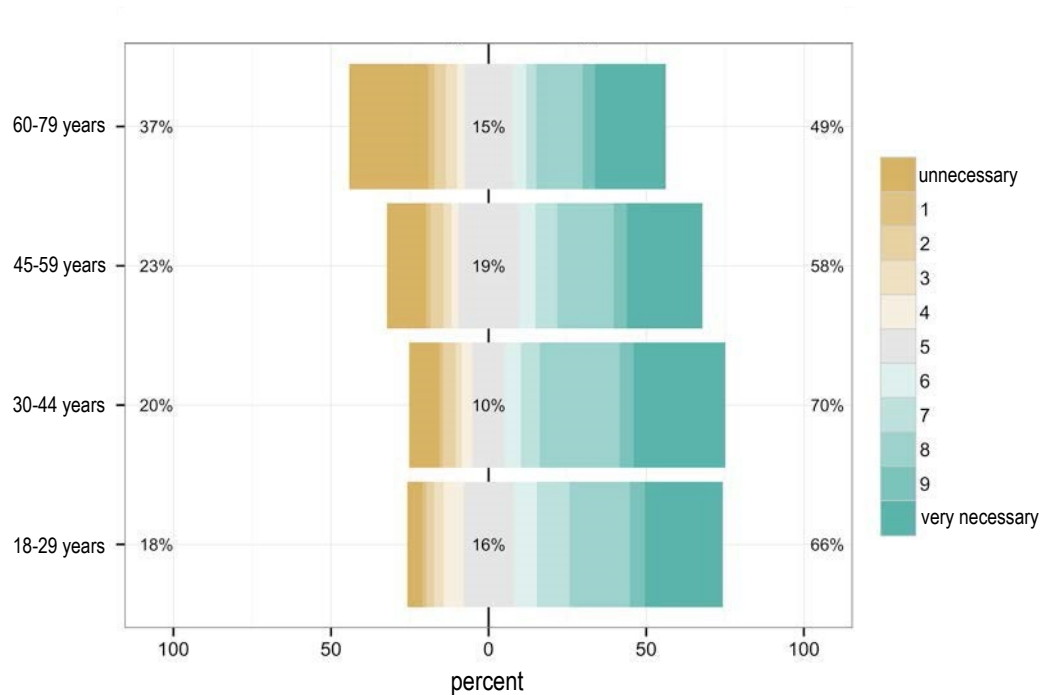
GRAPH 1: DEMAND FOR ELECTRONIC VOTING BY AGE GROUP

Furthermore, we also find explanation potential in the different linguistic regions. In the francophone part of Switzerland, the E-Voting offer is viewed significantly more desirable than in than in the Italian speaking Ticino. There, 24 percent of the population considered E-Voting to be completely superfluous, this is twice as high as the respective category in the francophone part. It is also – quite unsurprisingly – a higher trust in the internet and a higher internet usage, which correlates with the demand for E-Voting.
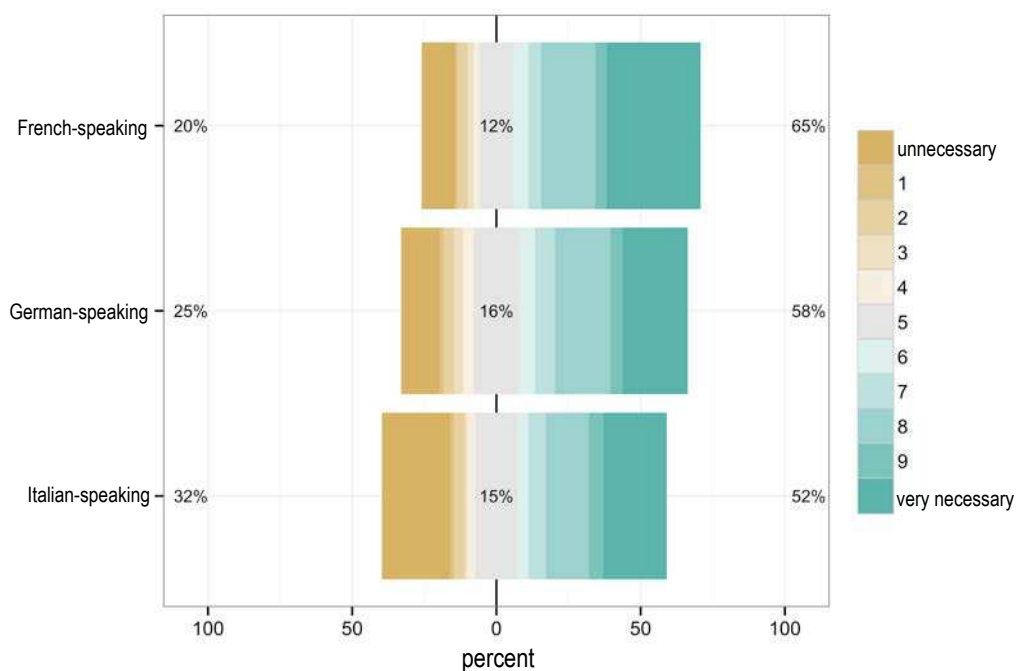
GRAPH 2: DEMAND FOR ELECTRONIC VOTING BY LINGUISTIC REGION

When one compares the demand for all three online services, it is evident that the necessity for E-Voting is considered to be the lowest of the three. The possibility, of ordering one's ID card via the internet is seen as slightly more desirable, whereas the demand for the possibility for remote compilation of the tax return achieves significantly higher results. However, one must bear in mind that – speaking in economic terms - the possible utility maximisation is greater for the other offers compared to E-Voting: The electronic tax return makes the task much easier, whereas the gains from postal voting to E-Voting are much less significant. Considering the higher demand for online tax returns is less astonishing, especially as it is offered in more cantons than electronic voting.

3.1   Motives and attitudes regarding E-Voting

Originally, it was only possible to cast one's ballot at the polling station. Between 1978 and 2005 postal voting was introduced step by step in all cantons. Data from vote registries and polls alike now show that between 80 and 90 percent of the electorate cast their ballot by mail.[7] The postal ballot has hence firmly established itself, but that was not always the case. Also, the postal ballot was confronted with mistrust, especially in the beginning. And the new voting channel had effects on the public's behaviour, the opinion-forming process and the turnout (Luechinger et al. 2007, compare as well: Funk 2005). However, also the strategies and processes of the campaign managers (see: Bernhard 2012) and the authorities were mistrusted in the beginning. The electronic ballot today stands in the same position where the postal ballot was about 40 years ago. Unsurprisingly we find similar questions as we did then: What do the people think of E-Voting and what expectations do they have from the electronic ballot.

3.1.1   Advantages and disadvantages of E-Voting from the view of the elector

In a first step the respondents were ask to spontaneously state advantages or disadvantages of E-Voting. Most often it was stated that E-Voting was comfortable, could be done from home and made the casting of the ballot more flexible (from everywhere, where there is an internet connection). In total more than half the respondents (55%) mentioned an advantage of comfortability. The youngest voters (18 to 19 year olds) stated this reason disproportionality often. The flexibility was mentioned most often by the interviewed with higher qualifications.

TABLE 3: ADVANTAGES OF E-VOTING

CHARACTERISTIC	N	IN % OF TOTAL ANSWERS	IN % OF INTERVIEWED
COMFORTABLE/CONVENIENT			
GENERAL ON COMFORTABLE/CONVENIENT	96	6	8
MAY BE DONE FROM AT HOME	328	19	27
FLEXIBILITY TIMEWISE (WHENEVER ONE WANTS TO)	138	8	11
FLEXIBILITY GEOGRAPHICALLY (FROM WHERE EVER ONE WANTS TO)	44	3	4
OTHER ON COMFORTABLE/CONVENIENT	63	4	5
TOTAL COMFORTABLE/CONVENIENT	669	37	55
SIMPLIFICATION OF VOTING PROCEDURE			
GENERAL	91	6	7

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[7] An example of this would be the voting statistics from the city of Zurich for the national elections of 2015: https://www.stadt-zuerich.ch/prd/de/index/statistik/publikationen-angebote/publikationen/webartikel/2015-10-27_Eidgenoessische-Wahlen-2015_Wahlbeteiligung-in-der-Stadt-Zuerich.html.

Quicker/Easier	242	14	20
Enables everybody to vote	24	1	2
Total simplification of voting	357	20	29
Effect on Participation and Quality of the Result			
In General (i.e. more participation)	216	13	18
The Young would vote more	97	6	8
Total Participation and Quality	313	19	26
Efficiency			
Economic/safes Money	32	2	3
Safes Paper	103	6	8
Total Efficiency	135	8	11
Simplification for Authorities			
Various (Quicker Counting, etc.)	35	2	3
«Zeitgeist» (Everything's online today, etc.)	17	1	1
Other	30	2	2
No Advantage	82	5	7
Don't Know/No Answer/Stated Disadvantage	61	4	5
Total	1669	100	139

Many (29%) view E-Voting as a simplification of voting, because it shortens the voting procedure or reduces the time necessary for voting.

About a quarter (26%) furthermore, believe that E-Voting will either increase participation or will enhance the quality of the decisions made. All the same, eight percent of all interviewed were confident that the young could be especially convinced by this voting channel. This advantage was stated by all age groups, and hence not only by the young.

A minority also saw advantages for the authorities: The counting of votes could be simplified, the results could be communicated faster (from which also the electorate would also profit) or – this was mentioned more often – the state (and hence also the tax payer) could save money. Especially popular was the answer (8%) that paper could be saved. All in all, seven percent did not mention an advantage.

Overall there were only minute differences between the characteristic groups. There were next to no differences between the linguistic groups. Not even a person's position on the introduction of E-Voting had an effect on what advantages were stated.

When ask about the disadvantages, a significant portion (40%) answered with concerns regarding the risk of manipulation and security. One in five feared the possibilities of scams and counterfeiting when E-Voting is use. A further 14 percent thought, hacking could be dangerous for E-Voting and five percent questioned, how it could be ensured that the person who should be voting is actually voting. Security concerns were widespread in the population. This was also the case for those persons who supported the introduction of E-Voting.

Furthermore, it was often mentioned that the exchange between the citizens would be compromised. This disadvantage was mentioned mostly by sympathizers of the SVP and the

CVP and respondents from rural regions.[8] It should be mentioned that this is not first and foremost a concern regarding E-Voting but more of the digital "phenomena" in general. This "phenomena" relates to the fact that individuals have the centre of their lives on the internet and interact every less frequently face to face. The respondents hence probably thought that this would have a negative impact on the decision-making process. It is also interesting in this regard that this concern was mention much less often by "digital natives", than by those who rarely or never use the internet. Furthermore, this finding is intriguing as the decision-making quality and E-Voting are rarely discussed. However, a significant number of voters have concerns in this regard.

It was also mentioned that certain characteristic groups could be overwhelmed with E-Voting. Older voters were especially mentioned (7%). Indeed, it was not the older voters themselves who stated these concerns but mostly young and the youngest voters.

A number of other concerns were stated. For example, technical difficulties, which could arise without any tentative of manipulation (i.e. power cut, transmission problems)? Five percent had a general distrust and mentioned no specific concern, whereas another five percent explicitly mentioned the danger from other countries (i.e. secret services) could monitor the election procedure.

Lastly, about a quarter (24%) of the interviewed could not mention a single disadvantage spontaneously. Some of these explicitly stated this fact, so it can be assumed that these *only* saw advantages. Others could not mention a disadvantage spontaneously which need not mean that they have no concerns in regard of E-Voting.

TABLE 4: DISADVANTAGES OF E-VOTING (IN %, WEIGHTED)

CHARACTERISTIC	N	IN % OF TOTAL ANSWERS	IN % OF INTERVIEWED
TECHNICAL PROBLEMS			
VARIOUS (BLACKOUT, WRONG TRANSMISSION, ETC.)	76	6	6
DISTRUST			
VARIOUS (GENERALLY LESS TRUST WORTHY)	62	5	5
MANIPULATION/SECURITY CONCERNS			
MANIPULATION/SCAMS	249	18	20
CAN'T BE CERTAIN THE RIGHT PERSON IS VOTING	64	5	5
SECURITY CONCERNS/HACKING	170	12	14
OTHER	17	1	1
TOTAL MANIPULATION/ SECURITY CONCERNS	500	26	40
DECISION MAKING PROCESS			
DOESN'T EXCHANGE VIEWS	87	6	7
DECISION QUALITY (DECISION MADE HASTILY)	73	5	6
OTHER	7	1	1
TOTAL DECISION MAKING PROCESS	167	12	14
COMPLEXITY			
(ELDERLY) PEOPLE DON'T KNOW HOW TO	82	6	7
NEED FOR PC/INTERNET	57	4	5

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[8] For comparison: The interviewed from rural areas mentioned the concern 17% of the time, where those from urban areas only 4%.

OTHER	14	1	1
TOTAL COMPLEXITY	153	11	13
CONTROL FROM ABROAD/DATA SECURITY			
OTHERS CAN MONITOR VOTES	63	5	5
OTHER TO CONTROL FROM ABROAD	3	0	0
TOTAL DATA SECURITY	66	5	5
OTHER	40	3	3
NO DISADVANTAGE	175	13	14
DON'T KNOW/NO ANSWER/STATED DISADVANTAGE	122	9	10
TOTAL	1362	100	111

3.1.2   Arguments

In a second step the attitudes towards arguments which were often mentioned for and against E-Voting were inquired. *Table 5* contains the acceptance values for each three pro and contra arguments. The argument which overall found the most acceptance was that of «convenience». 82 percent accepted that electronical voting from one's own home per mouse click would be more convenient than postal ballot. There is nearly unanimity on this issue. However, about a third (36%) thought at the same time that an electronic ballot was not necessary and that postal ballot was simple enough. In other words: most people acknowledge the convenience of E-Voting, however most value this increase, compared to the postal ballot, as so small, that it is of no importance in the decision making process. Another possible explanation would be that a significant number of the respondents are opposed to E-Voting for reasons of tradition. The above mentioned arguments were on the *additional* convenience of E-Voting *compared to postal ballot*. However, one must assume that people also subscribe to this argumentation even when they believe that E-Voting is superfluous, because it also worked without the electronic ballot in the past. This group is referred to as «traditionalists», as their opposition is not E-Voting specific, but mostly based on the will to protect what is already there. A case in hand is that the opinion of E-Voting as not being necessary can mostly be found among SVP supporters.[9]

The second most supported argument was that of the *zeitgeist*: About two thirds (68%) of the interviewed supported the statement that today everything is done over the internet, and hence it is about time that it should also be possible to cast one's ballot that way. Naturally it is mostly the young which support this line of argumentation. Whereas 82 percent of the under 20-year olds subscribed to this argument, only 54 percent of over 60-year olds did the same.

The third most supported pro-argument was much more controversial. About half (47%) the survey participants *were opposed* to the argument that wrong and invalid votes were impossible with E-Voting. However, it is not clear what the individual participants understood with this. Some might have thought about the *transmission* or at the utmost about the *registration and counting* of the ballots, when they stated their doubts. With the latter, errors are (theoretically) possible. The first however – for example listing six candidates when there are only five seats – will be impossible due to internal control mechanisms. The number of *don't know* answers (17%) shows that a significant amount of the surveyed were not able to make the distinction or make up their mind in that regard.

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[9] Overall about 44 percent seconded this argument. Among the SVP this number rose to 52 percent.

<mark>TABLE 5: ACCEPTANCE OF ARGUMENTS</mark>

ARGUMENT	N	AGREE	DON'T AGREE	DON'T KNOW/NA
«WHEN VOTING ELECTRONICALLY IT IS NOT POSSIBLE TO CAST AN INVALID OR ERRONEOUS BALLOT. »	1228	36	47	17
«WHEN VOTING ELECTRONICALLY IT IS POSSIBLE TO VOTE WITH A SIMPLE MOUSE CLICK FROM ONE'S HOME. THIS IS MORE COMFORTABLE THAN POSTAL VOTING. »	1228	82	17	1
«NOWADAYS NEARLY EVERYTHING CAN BE DONE VIA THE INTERNET. HENCE ITS TIME THAT ELECTRONIC VOTING BE UNIVERSALLY AVAILABLE. »	1228	68	31	1
«IT'S EASIER TO MANIPULATE A VOTE VIA THE INTERNET THAN VIA POSTAL VOTE. »	1228	61	33	6
«THE POSTAL VOTE IS SO SIMPLE, THAT ELECTRONIC VOTING IS NOT NEEDED. »	1228	44	54	2
«WITH E-VOTING THE DANGER OF FOREIGN SECRET SERVICES MONITORING THE VOTE. »	1228	57	37	6

[1]The categories «strongly agree» and «somewhat agree» or «somewhat disagree» and «strongly disagree» were merged.

The most widespread contra-argument was the manipulation argument: 61 percent of the interviewed believe that voting over the internet can more easily be manipulated than postal voting. It is interesting that this anxiety does not correlate either to the general trust in electronic transactions nor with a person's usage of the internet. This concern is most present among those who generally mistrust the Internet (65%). However, even amongst those who generally have high trust in the internet, the majority (54%) doubt E-Voting's security. The fear of manipulation is furthermore especially pronounced among voters of the Green party (70%), whereas amongst the electorate of the SP – which political is only minutely different from the Greens – this significantly less (59%).[10]

Another argument related to this with nearly identically high approval, 57 percent fear that E-Voting would enable foreign secret services to monitor the vote, which would entail a loss of voter anonymity. This fear is much more widespread among people who generally mistrust the internet (76%) than amongst those who generally regard the internet as being safe (43%). Again it is the Greens who are the most distrusting (66%) of the internal security. Significantly lower is the number for the supports of the SP (45%).

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[10] One must however bear in mind that the statistical error for the Green voters is 14 percent, whereas for the SP it is only seven percent. The difference is hence not statistically significant – mostly due to the small sample size of the Green voters. As however the findings are continuous over all related questions they were reported.

4   The trust in electronic voting

4.1   The trust in E-Voting compared to other modalities of voting

The trust in the different modalities of voting varies considerably. The most trusted form of voting is the personal casting of one's ballot in the booth (mean = 8.5). This form of voting has the explicit advantage that the ballot is consigned in front of the voter's eyes (and hence is personally verifiable), which increase the trust that one's vote is registered and counted. Furthermore, it is the oldest and «classic» form of voting. This is also why older voters have a high trust in this form of voting[11], especially since they will possibly still recall when this was the only form of voting.

TABLE 6: TRUST IN THE DIFFERENT WAYS OF VOTING

| VOTING FORM	N	MEAN	HIGHEST TRUST	DON'T KNOW/N.A.
VOTING IN THE POLLING STATION	1228	8.5	40	1
POSTAL VOTE	1228	8.2	28	.5
VOTING OVER THE INTERNET	1228	6.6	12	2

The exact wording of the question: «When voting it is important, then one can be confident, that one's vote has been registered and counted. In this regard how big is your trust in the following ways of voting? Please tell me on a scale from 0 to 10. 0 being no trust at all, 10 being complete trust. With values in-between you can grade your trust.»

The trust in the by now nearly universally available postal ballot is nearly as high (8.2). Interestingly, trust is not significantly lower in Ticino, than in the other linguistic regions. The italophone canton only introduced the postal ballot for elections recently (elections on the 19th of April 2015).[12]

Significantly lower is the trust in the electronic ballot (6.6). However, it should be noted that about 70 percent stated a value of trust, which was above the centre of the scale (5). We hence cannot talk of open *dis*trust. However, the other two modes of voting are more trusted than the electronic mode. One must bear in mind that this manner of voting is a *terra incognita* for most voters. In other words: They have never used it and hence lack the experience that would enhance trust. This statement is supported by values given by those interviewed who stated to have already used E-Voting. Their number is small (n=30), however their trust in E-voting (8.0) is just as high as their trust in the postal ballot (8.0). For those who never had the possibility to vote electronically, the value is much more sceptical thereof (6.6).

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[11] 45 percent of the oldest age group have highest trust, whereas for the youngest group this value is at 35 percent.
[12] Quite revealing are the arguments which were brought up against the postal ballot in Ticino until recently. One was afraid that «Galoppini» «would buy signed empty signed ballots from disinterested voters or 'help' swing voters with the compilation»(http://www.nzz.ch/schweiz/wahlzettel-zu-verkaufen-1.18523249)
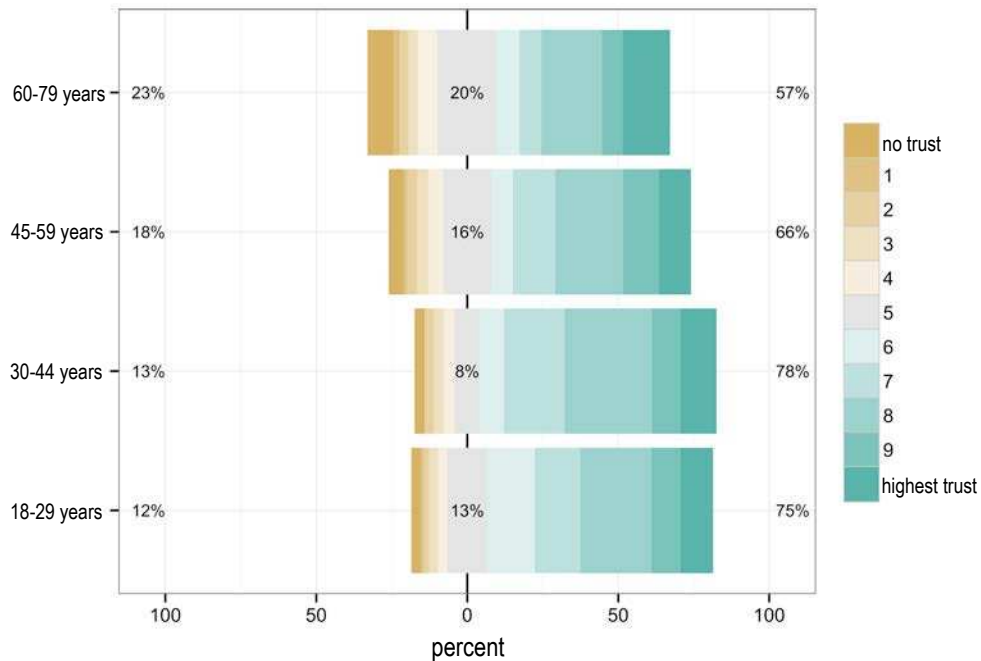
GRAPH 3: TRUST IN ELECTRONIC VOTING BY AGE GROUP

Different factors play an important role in the trust for electronic voting. First of all, it is the age. Young voters (under 20 years) have the highest trust in E-Voting (6.9) compared to, for example, the over 60 year olds (6.2). This is the case, independently, from their trust in the internet overall. Next is the education of a person: The higher an individual's formal education, the higher his trust. People who graduated from university have a mean value of 7.3, whereas for those with the least education the equivalent value is 5.8. The *usual suspects* – internet usage and general trust in the internet – also have a strong influence on the trust in E-Voting (see Graph 4). Last but not least, the linguistic group also has an influence on the trust: Italian speakers are the most sceptical of all language groups (6.0), whereas the French speaking have the highest trust with a value of 7.0.
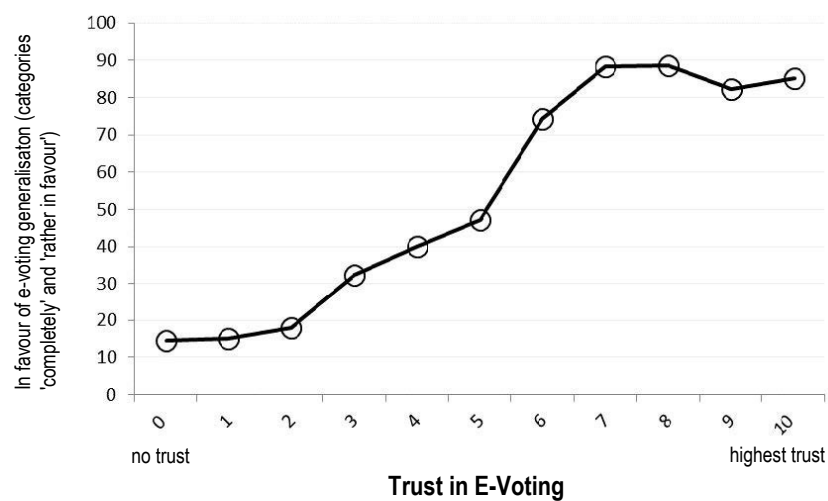
GRAPH 4: TRUST IN E-VOTING AND GENERAL TRUST IN THE INTERNET

Comparatively low is the trust amongst the supporters of two political parties: the SVP and the Greens. The sympathisers of the SP and the GLP on the other hand, have a comparatively high trust in E-Voting. However, this difference must not be over interpreted due to the low number of cases and the statistical error term. Nonetheless, as we will see later it is always these four parties which have the extreme values. Furthermore, also the supporters of the CVP were quite sceptical of electronic voting. One should nevertheless note that the majority of supporters of every party have above average trust values.
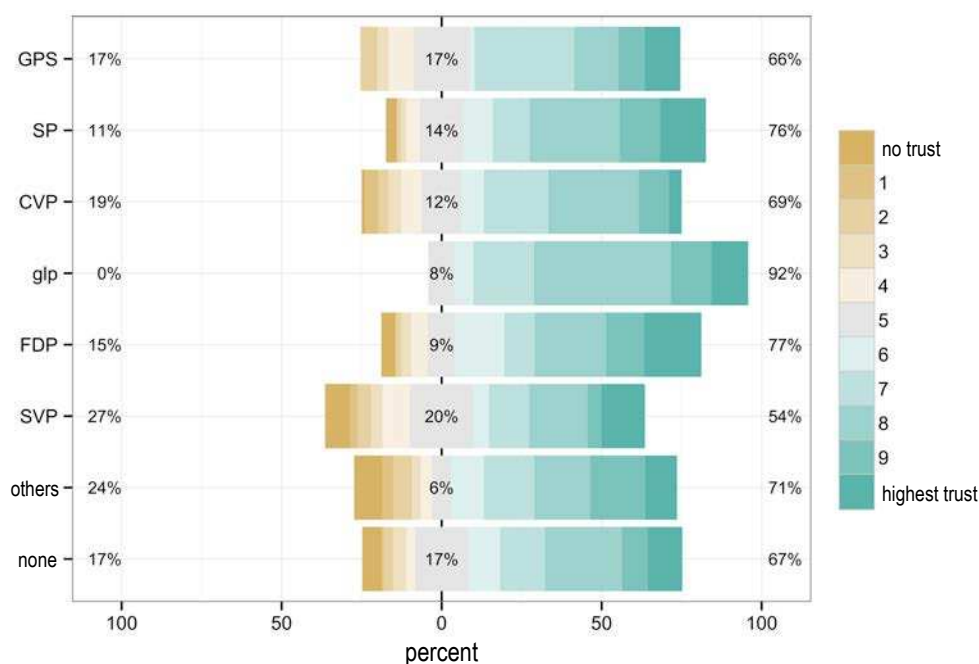
GRAPH 5: TRUST IN E-VOTING BY PARTY SUPPORT

4.2   Trust building measures

Which measures would most likely increase the trust in E-Voting and for which group? For this purpose, seven measures were proposed on which the respondents could take a position. The most liked was the printing of personal codes on the ballot, so as to ensure that the right person was voting. 68 percent thought this measure would increase their trust. 63 percent also thought that a test page, where one could practice the procedures of voting electronically, would make the exercise more trustworthy. A majority (55%) thought that security inspections by experts would make E-Voting more trustable. However, only a minority (43%) stated that receiving a paper recite after voting electronically, would be enhance their trust. Paper, the traditional voting material, was especially trust building amongst the older generations and less so with the young voters.[13] It is surprising that the inspection by experts is considered trust building, not however the more "democratic" inspection by citizens. Only 38 percent thought this would enhance trust.

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[13] Among the over 60 year olds 52 percent were in favour of this measure, whereas fort he under 20 year olds this number was only 29 percent.

TABLE 7: SUPPORT FOR TRUST BUILDING MEASURES

ARGUMENT	N	INCREASES TRUST	DOESN'T INCREASES TRUST	DON'T KNOW/NA
THE POSSIBILITY, TO TEST E-VOTING ON A TEST PAGE.	1228	63	28	9
PUBLISHING THE SOURCE CODE.	1228	22	21	57
RECEIVING A PAPER RECITE IN THE POST, AFTER ONE HAS VOTED OVER THE INTERNET.	1228	43	47	9
THE POSSIBILITY, TO OVERWRITE THE ELECTRONIC VOTE UNTIL THE DAY OF THE ELECTION.	1228	22	68	10
THAT EVERY VOTE BE TRACEABLE WITH A PERSONAL CODE PRINTED ON THE BALLOT.	1228	68	22	11
A SECURITY INSPECTION BY AN EXTERNAL EXPERT.	1228	55	33	12
THE OPENING OF THE ELECTRONIC BALLOT BOX UNDER THE PRESENCE OF CITIZENS.	1228	38	38	24

A majority of the surveyed (57%) was not convinced by the publishing of the source code. They withheld themselves from a substantial answer because they presumably did not know what the source code is and which possibilities of monitoring it offered. How little known the term was can also be seen by the educational background of respondents: There was close to no difference between the groups. Even the highly educated had difficulty expressing a substantial opinion.

The possibility of changing one's electronic vote, as often as one pleases to, was rejected by a clear majority (68%). Based on this number it can be assumed that the measure actually *rather weakens* the trust, possibly because one fears the possibility of *post factum* changes, over which the voter has no control.

Those who already have great trust in electronic voting, need no further convincing. The main focus must be to persuade those who are not yet convinced. For this purpose, we will take a closer look at those surveyed who expressed mistrust in E-Voting (a trust value of less than 5) (see Graph 6).
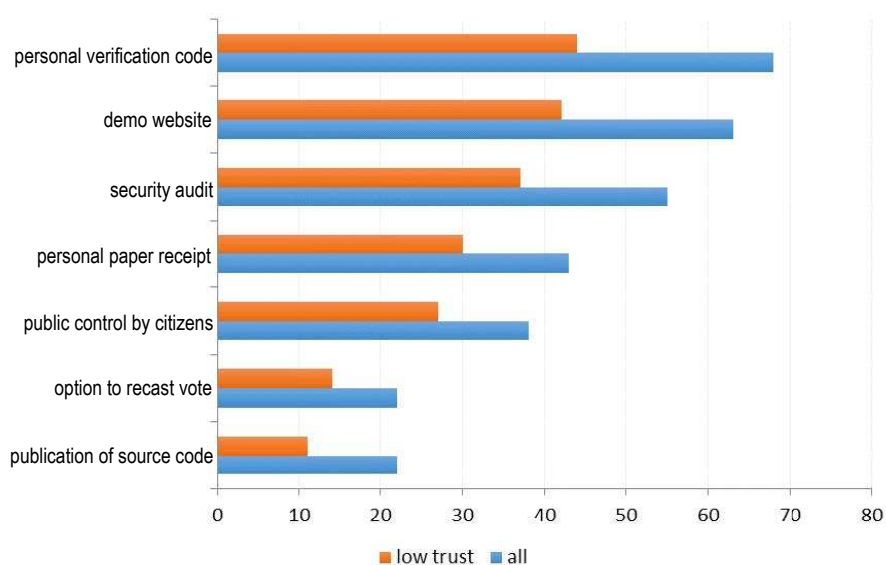

GRAPH 6: MEASURES AND TRUST IN E-VOTING: ALL SURVEYED AS WELL AS THOSE SCEPTICAL TOWARDS E-VOTING

The main difference is that this group is more difficult to be convinced by *any* of the measures. The order however is identical for both groups: The printed code on the ballot and a test webpage, lead the list in trust building measures.

4.3   Attitudes towards the comprehensive introduction of E-Voting

The last part of this analysis will be dedicated to the question: What does the public think of the comprehensive introduction of E-Voting and what are the drivers and obstacles of this development? First of all, it must be stated that two-thirds (69%) of the public are in favour of the introduction. Only 29 percent are rather or totally opposed.[14]

If one does the breakdown of the attitudes towards E-Voting, based on socio-demographic attributes, two characteristics become striking. The first is age: Generally speaking the older a person gets the less likely he/she is to support E-Voting. For example, a comprehensive introduction is an absolute must for under-30 year olds, whereas for over-70 year olds the support rate falls under 50 percent. This age effect is still visible even if we only consider those who vote on a regular basis. Indeed, one could argue that the differences between the youngest voters and their middle-aged counterparts can be attributed to their general willingness to vote.[15] However, as can be seen in the right half of graph 7 this is not the case. E-Voting – independent from the frequency of voting – is demanded unanimous especially amongst 30 year.
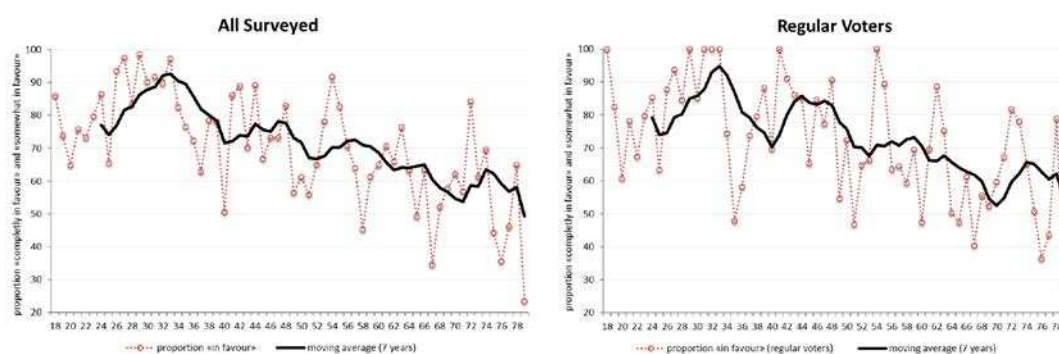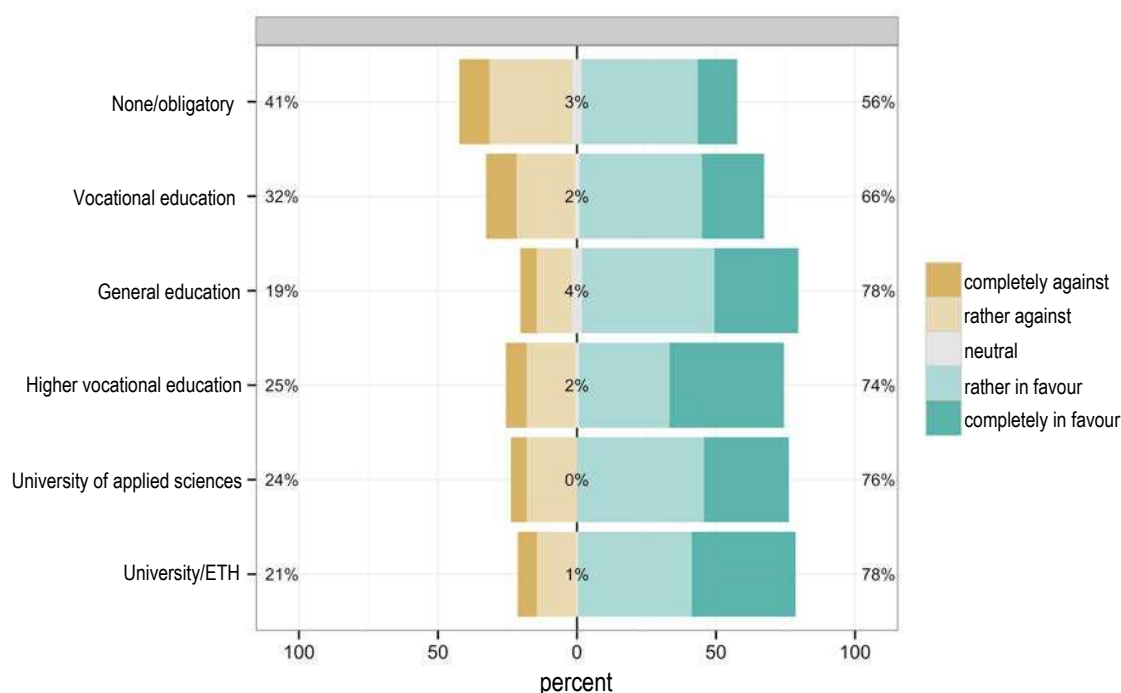

GRAPH 7: THE ATTITUDE IN REGARD OF THE COMPREHENSIVE INTRODUCTION OF E-VOTING BY AGE: ALL SURVEYED AND REGULAR VOTERS

Higher Education[16] also increases the approval of E-Voting. People who received tertiary education belong to the staunchest supports of E-Voting. Whereas the equivalent statistic for those who only received mandatory education is considerably lower. The participation rate, again, plays no significant, intervening role. These differences remain also when one only takes those into account who regularly vote. The demand for E-Voting generally finds stronger support amongst the higher educated voters.

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[14] 2 percent abstained from giving a substantial answer («don't know»).

[15] The attitude in regard to the introduction of E-Voting is naturally also influenced by how desirable one considers regular electoral participation. Someone who rarely or never casts his/her ballot will naturally also see little importance in the introduction of E-Voting. However, it is known that the willingness to participate electorally is far lower for the youngest part of the electorate than for their older counterparts (compare: Milic et al. 2014, Serdült 2013).

[16] The classification of degrees was done on the basis to the corresponding BfS-classification: http://www.bfs.admin.ch/bfs/portal/de/index/regionen/11/geo/raeumliche_typologien/00.html.

| | completely against | rather against | neutral | rather in favour | completely in favour |

GRAPH 8: THE ATTITUDE IN REGARD OF THE COMPREHENSIVE INTRODUCTION OF E-VOTING BY EDUCATION

However, there are no other socio-demographic differences. Neither a person's gender nor the urban-rural divide, have an influence. In cities about 70 percent were in favour whereas in rural areas this number was at 65 percent. It is surprising – at least by first glance – that the need for E-Voting is smaller in rural compared to urban areas. Due to the - ceteris paribus - high cost[17] of casting one's ballot in rural areas, it could have been expected for them to have a higher support for the comprehensive introduction of E-Voting. Yet, this is not the case. First, this is because E-Voting is especially popular amongst the «urban type» of voter. Not because this voter is especially dependent on E-Voting, or that it would considerably increase his participation rate, but because it fits his lifestyle. Furthermore, voters in rural regions tend to cast their ballot mostly via post, which refutes the higher cost argument. If one were to assess[18] the values for the individual districts, then one can notice that the differences are minor. The support level nearly never drops below 60 percent and are nowhere higher than 80 percent. The support level is especially high in urban area and in the peripheral regions in the alps, amongst them namely the canton of Grisons.

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[17] The logic behind the argument being that voting in a polling station is more consuming than in well-developed and densely populated urban areas.
[18] The district values were assessed using the MrMP-technique (Lax und Phillips 2009, Leeman und Wasserfallen forthcoming).
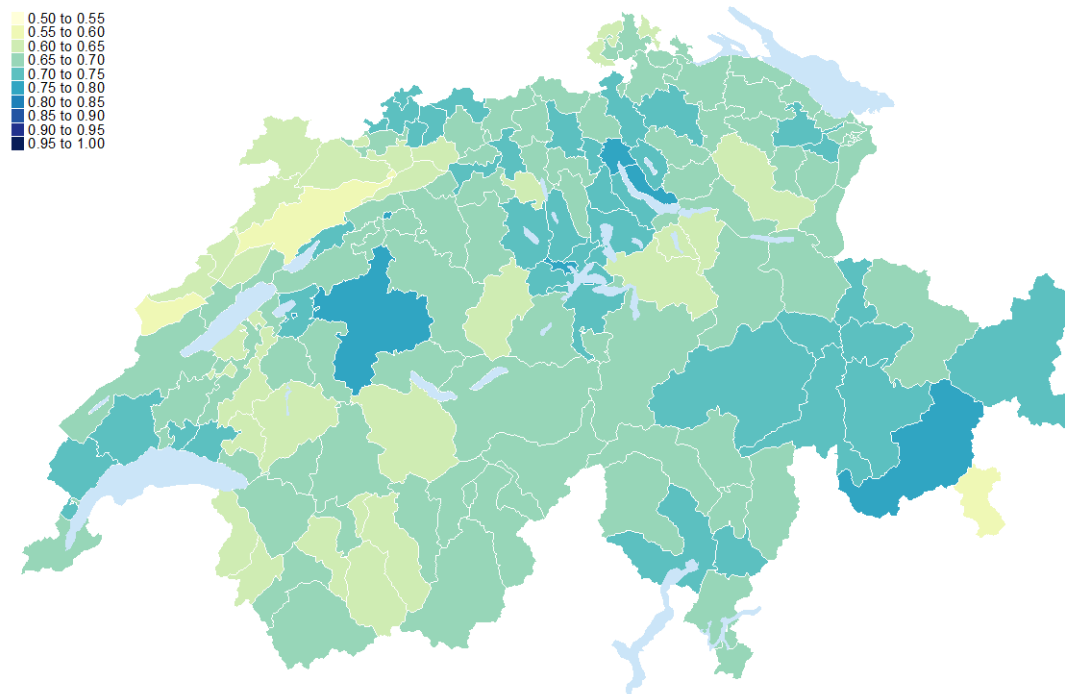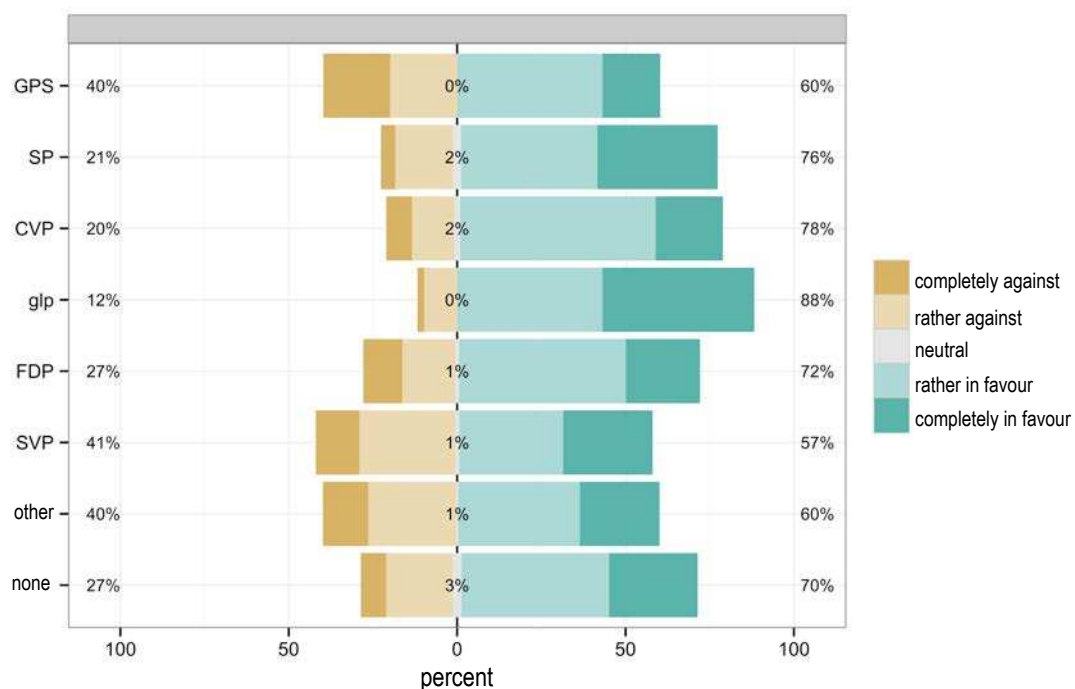
GRAPH 9: ATTITUDES IN REGARD OF THE INTRODUCTION OF E-VOTING BY DISTRICT (SHARE «VERY» AND «SOMEWHAT IN FAVOUR» IN PERCENT (P))

Generally, «psychological» (attitudes etc.) and political characteristics (party identification, ideological self-placement etc.) are of higher importance for the support of policies in general than socio-demographic variables. This is due to the fact that they are closer to one's actual behaviour than socio-demographic variables. The next section is dedicated to the influence of these intermediary psychological variables on the support of E-Voting.

First of all, we should expect that political interest and the frequency of voting would have an effect on the attitude towards E-Voting. This is because those who will most likely see a need for the introduction of E-Voting are firstly those who have a high interest in politics and secondly those who often cast their ballot. On the other hand, those who generally do not cast their vote and have little political interest will also not see any need in introducing the electronic ballot. In fact, these patterns emerged in the survey. However, it is surprising that political interest and the frequency of electoral participation only have a weak effect on the support of E-Voting. As mentioned there are differences but these are not very big (compare table 9 in the appendix).

It is also revealing that the proportion of strong opponents of E-Voting is the highest among the most politically interested.[19] This is again a hint towards the fact that the opposition towards E-Voting has many causes: Some oppose it for «traditionalist» reasons, others due to a fear of manipulation, which is especially among the highly educated a sensitive issue.

The last issue can also be found in the support values of the sympathisers of the individual parties. Because most of the «sceptics» come from two parties which could not have less in common: the Greens and the SVP. Amongst the Greens the support value is 60 percent, amongst the SVP it is 57% (compare Graph 10). For comparison the equivalent values for SP and GLP-supporters: Among the first it is 76 percent and amongst the latter, which have an urban and highly educated support base (Lutz 2016), it was 88 percent who «very» or «somewhat» supported the introduction of E-Voting.[20] Furthermore, the proportion of those who are strongly opposed to the introduction of E-Voting is the highest among the supporters of the Greens: one in five questioned stated that he/she was «very» opposed to the introduction of E-Voting.
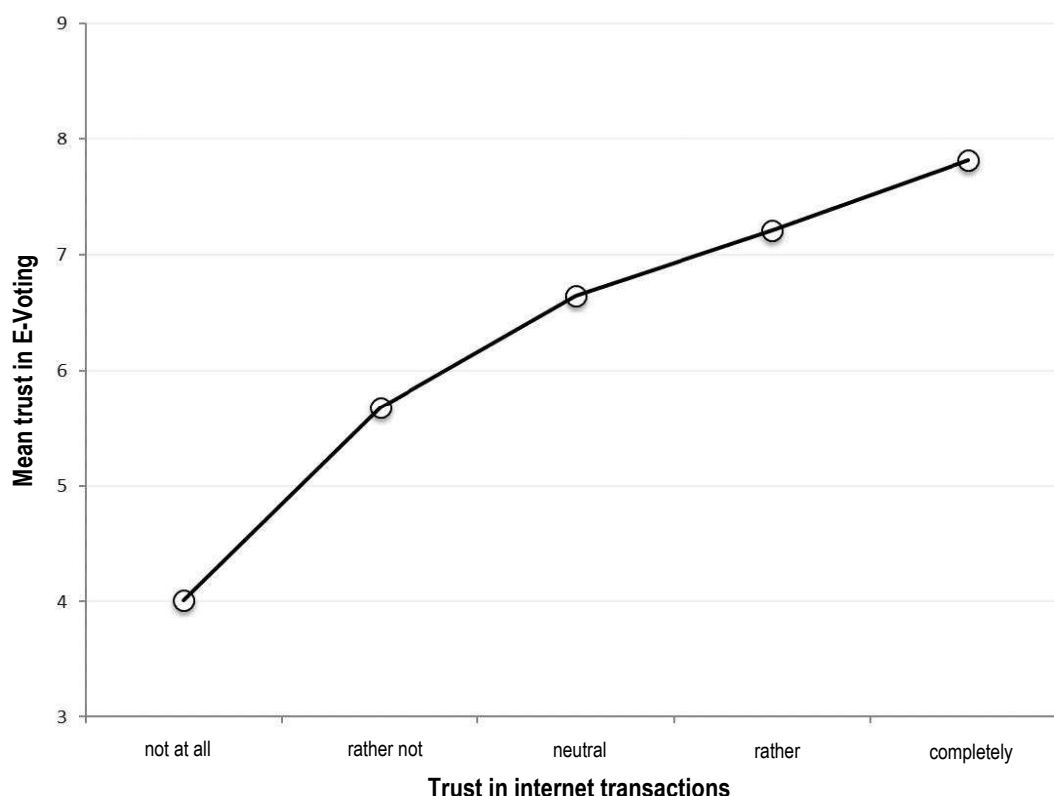

GRAPH 10: ATTITUDE IN REGARD OF THE INTRODUCTION OF E-VOTING BY PARTY SYMPATHY

Furthermore, also the general distrust of the internet cannot explain the sceptical views of E-Voting. The Greens do not mistrust the internet more than other party supporters. What distinguishes them and the supporters of the SVP is their comparatively low trust in the electronic ballot *in particular* (compare graph 5 and graph 14). This does not, however, mean that the trust in the Internet is irrelevant. Quite the opposite, the trust one has in the Internet plays a substantial role. The following graph 11 demonstrates impressively, how strongly these to variables correlate with one another.

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[19] However, also the number of strong supporters of the introduction of E-Voting was the highest among the highly politically interested.

[20] Due to the partly low number of respondents the values have a somewhat high statistical error term: Greens: +/- 15%; SP: +/- 6 %; glp: +/- 10 %; SVP: +/- 7 %.

GRAPH 11: ATTITUDE IN REGARD OF THE INTRODUCTION OF E-VOTING AND TRUST IN THE INTERNET

This is nevertheless not a surprising finding. Those who do not trust the Internet will also not trust E-Voting. In principle one could say that trust in the internet is a *necessary (even if not sufficient)* condition, for the support of the introduction of E-Voting. However trust *alone* is not sufficient, as the supporters of the Greens demonstrate. They don't have – unlike the supporters of the SVP – a strong distrust in the internet, but are comparatively sceptical of E-Voting. As seen above the Greens have one main concern in regard of E-Voting: The risk of manipulation is higher than with the postal ballot. This risk of manipulation is fundamentally given in all Internet transactions. Hence this discrepancy between general trust in the internet and trust in E-Voting leaves some questions. A high technical exposure to manipulation of E-Voting (compared to the likes of E-Banking) does not seem to be the reason of the Green's scepticism. Presumably it is because transparency and the risk of manipulation weigh higher in a democratic vote than in other internet activities.

However, no interaction between party-sympathy and age can be detected. For this we compared the support level of E-Voting amongst the three largest parties (SVP, SP and FDP). In all three parties the support levels sink for the over 45 year olds – independently of the party support. The SVP supports are the most sceptical over all age groups.
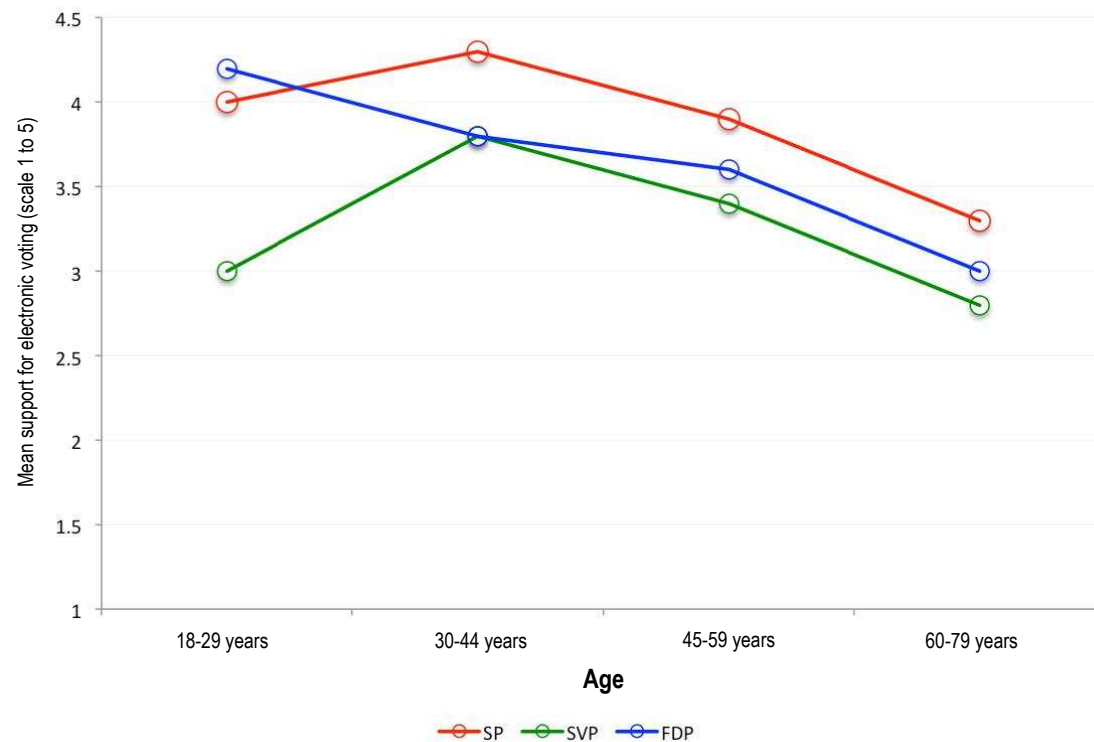
GRAPH 12: ATTITUDE IN REGARD OF THE INTRODUCTION OF E-VOTING BY AGE AND PARTY SYMPATHY

In a last step the attitudes towards E-Voting were analysed multivariatly. A multivariate analysis enables the determination of the relative strength of influence of the individual variables. With relative strength of influence we measure the effect after it has been «cleansed» from covariate effects. For the case at hand, we can for example test how strong the influence of age is when we control for internet usage at the same time, knowing that younger respondents have a higher propensity to use the internet than their older counterparts. A multivariate analysis, unlike a bivariate one, can produce exactly this explanatory power. Hence in a first step we considered all socio-demographic variables in a multivariate model. The attitude towards the introduction of E-Voting was furthermore dichotomised (meaning it was transformed in to a variable consisting of only two values - «for» and «against»), so as to be examinable in a logistic regression model. The following graph 13 shows the odds ratios for the individual effects. The odds ratios provide an analysis of the chances of being either for or against the introduction of E-Voting. The higher the odds the higher the positive effect of the given variable on the support of E-Voting. The lower the odds, the stronger the negative effect is.
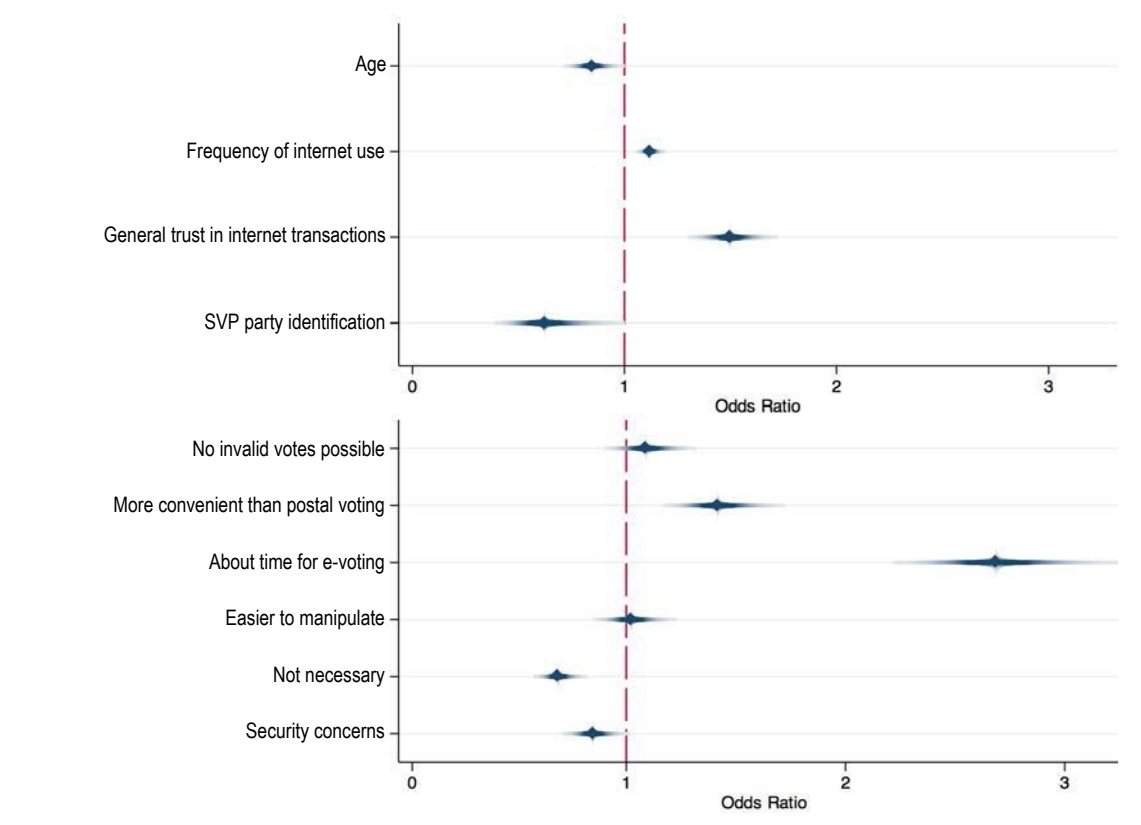
GRAPH 13: MAGNITUDE OF THE EFFECTS OF THE MOST IMPORTANT EXPLANATORY VARIABLES OF THE SUPPORT OF E-VOTING

The usage and trust of the internet have the strongest effect on the attitude towards E-Voting (model above). This finding is little surprising. More surprising is that the effect of a person's age remains significant even when controlled for these two variables. Young voters tend to support E-Voting more than their older counterparts, independent from their trust or usage of the internet. Lastly support of the SVP remains significant. SVP supporters are generally more sceptical of E-Voting than those of the other parties. This is also the case for supporters of the Greens; however the effect is not statistically significant. This is probably due to the low case number, which leads to a higher probability of rejecting the null hypothesis.

The same logistic model was then also tested with the arguments regarding E-Voting (model below).[21] The central question of this analysis was: Which arguments have the strongest influence on the support of the introduction of E-Voting?

The argument of the *zeitgeist* proved to be the most convincing: those who are convinced that to renounce E-Voting would be an anachronism, strongly supported the introduction of E-Voting, independent of whatever other problems he/she saw. Also the notion of increased commodity had a strong effect on the support of E-Voting. Those who saw E-Voting as a more comfortable alternative to the postal ballot were mostly in the favour of its introduction. The opponents to E-Voting were mostly recruited from the traditionalists and those who saw no added value in its introduction. This is also somewhat true for those who feared security issues. The bigger the fear of manipulation and other threats was, the stronger the opposition to the introduction. Surprisingly this is also a non-finding: security fears had no significant effect on the support of

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[21] We decided not to test a model which contained both socio-demographic variables and the argument attitudes. Due to the fact that the explanatory power of both sets can be located on different levels.

E-Voting. As can be seen further above this is also due to the fact that these fears are quite common. However, many are not prevented from supporting E-Voting by this. We can only speculate why this is the case. A possibility could be that the risks are taken willingly because the benefits are considered higher than the possible drawbacks. Furthermore, it could be possible that the risks are thought to be real, but not very feasible.[22] Possibly some are of the conviction that *no form* of voting is safe of manipulation, or that the decision making process is already corrupted in other ways) such as campaigns, the media or civil services), that the *additional* risk introduced by E-Voting makes no difference.

4.4   Conclusion

A majority of the Swiss electorate are in favour of the introduction of E-Voting. The young especially believe that the electronic ballot should be available throughout the country. This is not due to the fact that E-Voting is considered simpler and more comfortable than other forms of voting, but rather that it is considered part of the «digital» lifestyle. The «digital natives» are continuously growing in number - hence the demand for E-Voting should increase over time. A big part of the electorate is convinced that E-Voting would increase participation. However, it is questionable if this hope will become an empiric reality.

Participation studies suggest only a small increase in turnout and the postal ballot in its time only increased participation gradually. However, the survey shows that at least the citizens connect a positive effect on participation with E-Voting, which is definitely an advantage for its acceptance.

Nevertheless, there remains much to do – especially in regard to security issue, both in development as well as in the communication of its security. Regardless of their truthfulness a substantial part of the electorate has concerns in regard of security. Some of them, especially those who use the internet regularly, are prepared to take these risks. Others however are not. Their concerns must be taken seriously and their trust must be won, if E-Voting is to be successfully introduced. Furthermore, concerns which are seldom discussed in regard to E-Voting, but which are common among their elderly voters must be addressed: these concerns do not regard the technical incompetence of the elderly, for which the younger are more concerned. They are much more focused on the quality of the decision making process, which they fear would diminish under the «digitalisation of politics». Here a way must be found to maintain a lively exchange of opinions, which is essential to a democracy, in the digital age.

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[22] In principle it should be analysed for how likely the respondents think manipulation is.

4.5   Appendix

4.5.1   The Survey

The survey was conducted by the polling agency LINK between the 11th and the 21th April 2016. The statistical population were all Swiss citizens with the right to vote between 18 and 79 years of age which could be contacted telephonically in one of the three official languages (German, French and Italian). The initial sample was of 1'523 interviewed, from which 1'228 fulfilled the criteria. So as to have statistically reliable data from the two linguistic minorities, these were represented disproportionally in the sample. The sample of German speakers was 801 (values from the initial sample), the French speakers amounted to 441, and the Italian speakers to 278. During the analysis the linguistic groups were weighted so that the effective linguistic proportions were achieved. The survey was part of the «day-to-day»-omnibus of LINK, which is under taken using computer-assisted telephone interviewing (CATI).

4.5.2   The Sample

The sample is a mentioned above a disproportionality layered random sample. Furthermore, it is a «dual frame» sample: The sample is drawn to 50%[23] each from two lists: On the one hand of publicly accessible list of landlines, whereby the target person was selected via the random-strata method. The other half of the targets was selected using mobile RDD. The choice of the targets was undertaken directly via mobile numbers, whereby they were previously contacted by text message.

All samples have some uncertainties. This random error is usually given by the 95 percent confidence interval. In other words: the sampling error is declared (and the confidence interval which is derived therefrom), which states in what range the effective value lies with a certainty of 95 percent. For the net random sample at hand of 1'228 interviewed the sample error with a distribution of 50/50 percent is +/- 2.9 percent. The corresponding confidence interval in the present example is then 47.1-52.9 percent.

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[23] Regarding questions in as how far the composition of the sample corresponds to the Swiss reality, we refer to the technical report of LINK.

4.5.3   Further Tables and Graphs

TABLE 8: ATTITUDE IN REGARD OF THE INTRODUCTION OF E-VOTING BY SOCIO-DEMOGRAPHIC CHARACTERISTICS

CHARACTERISTICS	N	IN FAVOUR	OPPOSED	DON'T KNOW/N.A.
ALL INTERVIEWED	1228	69	29	2
GENDER				
MALE	605	71	28	1
FEMALE	623	68	29	2
TYPE OF MUNICIPALITY				
CORE CITY	465	70	27	2
MAIN CORE	356	70	26	3
SECONDARY CORE	95	71	29	0
AGGLOMERATION	248	72	27	1
MULTIPLE ORIENTED COMMUNE	86	72	28	0
CORE COMMUNE OUTSIDE OF AGGLOMERATION	48	65	32	3
RURAL COMMUNITY	225	64	35	1
AGE GROUPS				
18-19 YEAR OLDS	34	77	18	5
20-29 YEAR OLDS	193	78	20	1
30-44 YEAR OLDS	266	80	19	2
45-59 YEAR OLDS	360	67	32	0
OVER 59 YEAR OLDS	375	55	41	4
EDUCATION				
NON/OBLIGATORY	165	56	41	3
VOCATIONAL EDUCATION	525	66	32	2
GENERAL EDUCATION	116	78	19	4
HIGHER VOCATIONAL EDUCATION	128	74	25	2
UNIVERSITY OF APPLIED SCIENCES	101	76	24	0
UNIVERSITY/ETH	179	78	21	1
LINGUISTIC GROUP				
GERMAN SPEAKING	687	70	28	2
FRANCOPHONE	340	67	36	2
ITALOPHONE	201	66	30	4
POSSIBILITY OF E-VOTING				
YES	73	66	34	0
NO	1120	70	28	2

TABLE 9: ATTITUDE IN REGARD OF THE INTRODUCTION OF E-VOTING BY POLITICAL CHARACTERISTICS

CHARACTERISTICS	N	IN FAVOUR	OPPOSED	DON'T KNOW/N.A.
ALL RESPONDENTS	1228	69	29	2
TRUST IN THE INTERNET				
COMPLETELY	176	79	18	3
RATHER	580	81	19	0
RATHER NOT	259	57	41	2
NOT AT ALL	162	36	59	5
POLITICAL INTEREST				
VERY INTERESTED	246	70	28	2
RATHER INTERESTED	623	72	26	2
RATHER UNINTERESTED	254	64	34	1
NOT AT ALL INTERESTED	102	63	33	4
VOTING FREQUENCY				
ALWAYS (10)	465	69	29	2
OFTEN (7-9)	370	76	23	0
AVERAGE (4-6)	197	63	36	2
SELDOM (1-3)	117	66	29	4
NEVER (0)	73	66	30	4
INTERNET USAGE				
MULTIPLE TIMES A DAY	668	78	21	1
ONCE A DAY	186	74	24	1
MULTIPLE TIMES PER WEEK	134	68	30	2
ONCE A WEEK	47	49	51	0
MULTIPLE TIMES PER MONTH	24	60	40	0
LESS	48	42	53	5
NEVER	119	29	64	7
PARTY IDENTIFICATION				
GPS	40	60	40	0
SP	193	76	21	2
CVP	78	78	20	2
GLP	37	88	12	0
FDP	168	72	27	1
SVP	175	57	41	1
OTHER	76	60	40	0
NO PARTY/D.K.	461	70	27	3
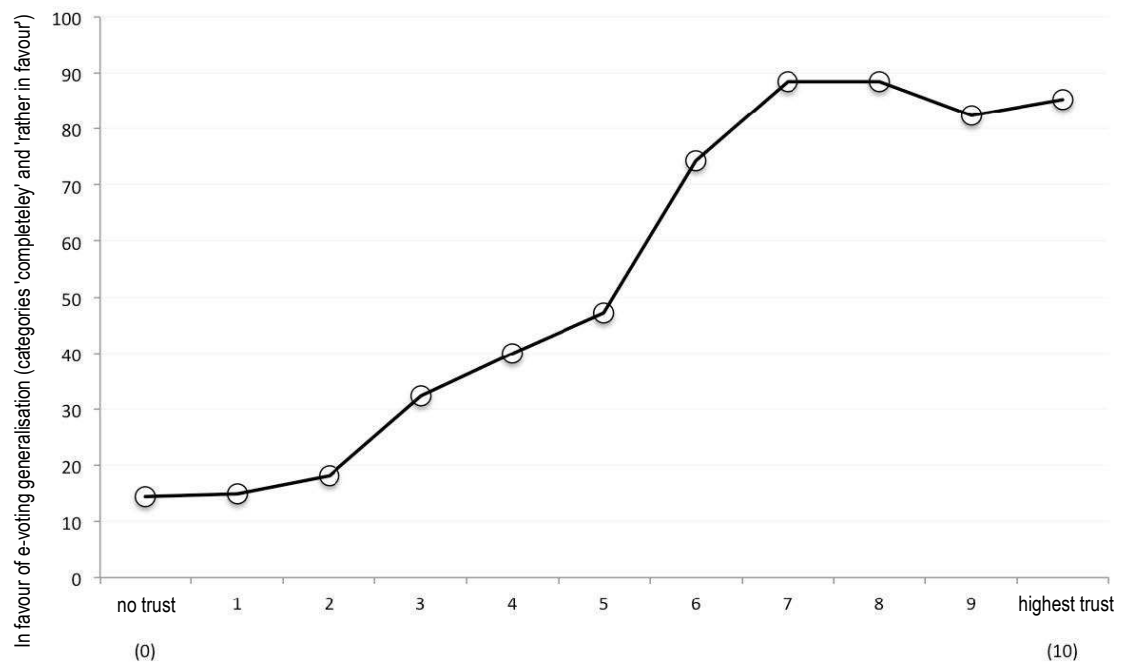
GRAPH 14: THE ATTITUDE IN REGARD OF THE INTRODUCTION OF E-VOTING AND TRUST THEREIN

5 References

Bernhard, Laurent (2012) Message Delivery, in: Kriesi, Hanspeter (Hrsg.) *Political Communication in Direct Democratic Campaigns. Enlightening or Manipulating?* Basingstoke: Palgrave Macmillan, 82-92.

Bochsler, Daniel (2010) Can Internet Voting Increase Political Participation? Remote Electronic Voting and Turnout in the Estonian 2007 Parliamentary Elections, Presentation at Internet and Voting Conference Fiesole, 2010. http://www.eui.eu/Projects/EUDO-PublicOpinion/Documents/bochslere-voteeui2010.pdf

Bochsler, Daniel und Pascal Sciarini (2010) So Close But So Far: Voting Propensity and Party Choice for Left-Wing Parties, *Swiss Political Science Review* 16 (3): 373–402.

Bundeskanzlei (2013) *Bericht des Bundesrates zu Vote électronique*. Auswertung der Einführung von Vote électronique (2006-2012) und Grundlagen zur Weiterentwicklung. http://www.bk.admin.ch/themen/pore/evoting/07977/index.html?lang=en

Funk, Patricia (2010) Social Incentives and Voter Turnout: Evidence from the Swiss Mail Ballot System. *Journal of the European Economic Association* 8(5): 1077–1103.

Germann, Micha und Uwe Serdült (2014) Internet Voting for Expatriates: The Swiss Case, *JeDEM – eJournal of eDemocracy & Open Government* 6 (2): 197-215.

Germann, Micha, Conradin, Flurin, Wellig, Christoph und Serdült, Uwe (2014) Five Years of Internet Voting for Swiss Expatriates. In: Peter Parycek, and Noella Edelmann (eds.) *CeDEM 14. Conference for E-Democracy and Open Government*. 21-23 May 2014, Danube University Krems, Austria. Krems: Danube University Krems, 127-140.

Lax, Jeffrey R. und Justin H. Phillips (2009) Gay Rights in the States: Public Opinion and Policy Responsiveness. *American Political Science Review* 103(3): 367-386.

Leeman, Lucas und Fabio Wasserfallen (forthcoming). Extending the Use and Prediction Precision of Subnational Public Opinion Estimation. *American Journal of Political Science*. http://www.fabiowasserfallen.ch/Website/Publiations_files/AJPS_leemann_wasserfallenl.pdf

Luechinger, Simon, Myra Rosinger und Alois Stutzer (2007) The impact of postal voting on participation. Evidence for Switzerland. *Swiss Political Science Review* 13(2): 167–202.

Lutz, Georg (2016) *Eidgenössische Wahlen 2015*. Wahlteilnahme und Wahlentscheid. Lausanne: FORS.

Mendez, Fernando und Serdült, Uwe (2014) From initial idea to piecemeal implementation: Switzerland's first decade of Internet voting reviewed, in: Zissis, Dimitrios and Lekkas, Dimitrios (Eds.) *Design, Development, and Use of Secure Electronic Voting Systems*. Hershey PA: IGI Global, 115-127.

Milic, Thomas, Bianca Rousselot und Adrian Vatter (2014) *Handbuch der Abstimmungsforschung*. Zürich: NZZ Verlag.

Sciarini, P.; Cappelletti, F.; Goldberg, A.; Nai, A. und A. Tawfik, A. (2013) *Étude du vote par internet dans le canton de Genève, Rapport final à l'intention de la Commission externe d'évaluation des politiques publiques*, Département de science politique et relations internationales, University of Geneva, 2013. http://ge.ch/vote-electronique/media/site_vote-electronique/files/imce/doc_rapports/rapport-finalsciarini-vote-par-internet.pdf

Serdült, Uwe (2013) Partizipation als Norm und Artefakt in der schweizerischen Abstimmungsdemokratie – Entmystifizierung der durchschnittlichen Stimmbeteiligung anhand von Stimmregisterdaten aus der Stadt St. Gallen, in: Good, Andrea; Platipodis, Bettina (Hrsg.). *Direkte Demokratie: Herausforderungen zwischen Recht und Politik*, Festschrift für Andreas Auer zum 65. Geburtstag, Bern: Stämpfli, 41-50.

Serdült, Uwe; Micha Germann; Fernando Mendez; Alicia Portenier und Christoph Wellig (2015) Fifteen Years of Internet Voting in Switzerland: History, Governance and Use, *IEEE Xplore* CFP1527Y-PRT, 126-132.